Creating a Market for Entertainment Video in VR - Steps to get from Here to There

www.vr-if.org
Where are we today?

Gartner **Hype Cycle** for Emerging Technologies, 2017

[Diagram showing the Gartner Hype Cycle with various technologies plotted along the cycle, including Virtual Reality highlighted.]

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Where are we today?

Source: BT Sport
Where are we today?

Source: Netflix, Facebook, Sony, Hulu, FullMag
Where are we today?

- First steps: VR360
- Video: Mono or Stereo
- Audio: Stereo or Spatial
- Very low resolution
- Limited (head) motion
- Large HMDs
- Market Fragmentation
- Consumer Confusion
- Poor Monetization
Where are we headed?

- Full immersion - “six degrees of freedom”
- Real and computer-generated – and indistinguishable
- Immersive story-telling
- Enjoy an event as if you were there
- Enjoy it with friends

Source: HypeVR, Lytro
What is required to get there?

- **Attractive Consumer Experience:**
  - Great content
  - Easy to use
  - No side-effects
  - Affordable
  - Interoperable

- **Attractive Provider Proposition:**
  - Broad Distribution Pipeline
  - Based on Standards
  - Secure & Sustainable
What is required? – Standards, but...
What is required? – Interoperability
Mission VR Industry Forum

To further the widespread availability of high quality audiovisual VR experiences, for the benefit of consumers

- Non-profit organisation established during CES 2017, after a year of informal meetings
Who Are We?
GOALS & PRINCIPLES
Goal – Creating a Market for 360VR

For consumers:
• **Make 360VR a high-quality, immersive, cross-platform experience**

For content producers & service providers:
• **Broaden reach and reduce cost caused by format proliferation (cost of production, distribution, etc.), secure content**

For device makers:
• **Ensure a wealthy, premium quality content pipeline**

For advertisers:
• **Drive the creation of a broad, unique & innovative sales channel**
Principles

- Advocating voluntary **industry consensus** around common technical standards for the end-to-end VR ecosystem, from creation to delivery and consumption
- Advocating the creation and adoption of **interoperable standards** (VRIF will not develop standards itself); promoting the use of common profiles across the industry, and promoting and **demonstrating interoperability**
- Developing **voluntary guidelines** that describe best practices, to ensure high quality VR experiences
What can VRIF do for you?

- Enable an end-to-end premium content pipeline to consumers by:
  - Ensuring UHD quality of experience
  - Making sure that underlying standards are relevant and interoperable
  - Adapting security systems to the special requirements of Virtual Reality
  - Investigating the “Human Factors” of VR experiences
  - Providing a neutral, cross-industry platform to discuss market needs

- This is the basis for a sustainable market for virtual reality video
VRIF Guidelines

- Publish **Guidelines** by CES 2018
  - Production
  - Distribution
  - Security
  - Creation of Interoperability Points
- **Draft Guidelines** published during IBC 2017 for Industry Review
- **Lexicon** for common terminology
- Draft Guidelines and Lexicon now available at [www.vr-if.org](http://www.vr-if.org)
Human Factors

- Human Factors that impact the VR experience
  - Physiological (eye/human visual system, ear/human auditory system)
  - Physio-cognitive (motion sickness, sensory conflicts)
  - Psycho-cognitive (presence, realism of immersion, interaction)
  - Psycho-social (violence, addictions, etc.)

Source Pictures: Wikipedia/Wikimedia

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Production

- How to produce immersive quality content
- Started from SKY’s “Technical Guidelines”
- Technical recommendations (capture, recording, resolution, immersive audio, storage and exchange formats, frame rates …)
- Incorporating results of human factor studies (cuts, motion, etc.)
- Content Exchange Metadata
Distribution

- Based on “OTT Download and Streaming” cases, Live coming soon
- Guidance and recommendations to implement VR video and audio profiles from MPEG OMAF (“Omnidirectional MediA Format”)
  - Viewport Independent media profile → Stream Everything
  - Viewport Dependent media profile → Focus on Viewport
  - 3D Audio media profile based on MPEG-H Audio

- Configuration of packing, projection and supporting metadata

- Use of Adaptation Sets for MPEG DASH based streaming
Security

- High quality VR productions can be very expensive to make, and need to be able to be monetized
- In practice, this means content protection
- Starts from MovieLabs Enhanced Content Protection spec; looks at what’s the same for VR, and what’s different
- Clear challenge: secure pipeline that includes rendering step
- Another challenge: securing privacy-sensitive data, preventing against “nausea attacks”
VRIF’s Potential Future Activities

- Conduct interoperability tests
  - Provide test tools and processes for end-to-end interoperability
  - Collect content that can be used for testing and experimentation
- Look beyond 360 3DoF toward 3DoF+ and 6DoF
- Investigate potential of HDR and HFR for VR Video
- Broaden and deepen the membership base
- Future activities are driven by members – Come and Join us!

www.vr-if.org/join
Upcoming Events

- **3GPP & VRIF WS on Virtual Reality Ecosystem & Standards**
  - Date: December 4-6, 2017
  - Location: Ericsson Campus Santa Clara, CA
  - $50 participation fee, call for speakers still open
  - Confirmed speakers include Oculus, Qualcomm, Verizon, Orange, Baobab
  - Register at http://www.vr-if.org/bin/c5i?mid=5&rid=6&k2=6

- **VRIF 6DoF Mixer**
  - Date: December 6th, 2017, 3-5PM PDT
  - Location: Ericsson Campus Santa Clara, CA

- **VRIF F2F**
  - Date: December 7-8, 20917
  - Location: Ericsson Campus Santa Clara, CA
Membership Levels

**Associate Members – $1,000 / year**
- Open to SME (annual revenue less than $10 million), academia, consultants
- Voting participation in Working Groups
- Participate in promotional activities; be listed on the VRIF’s website

**Contributor Membership – $4,500 / year**
- Be listed as a Contributor Member in all press releases of VRIF
- Vote in Board of Director elections

**Charter Membership – $10,000 / year**
- Stand for Election / Nominate representatives for Board of Directors
- Be listed as a Charter Member in all VRIF press releases and events
THANK YOU

WWW.VR-IF.ORG/GUIDELINES